

Appl. No. : 09/873,510  
Filed : June 4, 2001

### AMENDMENTS TO THE CLAIMS

Please cancel Claim 1 without prejudice and amend the Claims as follows.

Insertions are shown underlined while deletions are ~~struck through~~. Further, please add Claims 19-23.

1 (canceled)

2 (currently amended): ~~The~~A method ~~according to Claim 1~~for controlling performance of  
a machine controlled by at least one control module having an input-output relationship regulated  
by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control  
parameters by preselecting genes constituting the first generation of chromosomes from a  
selection space used as a gene pool, and activating the machine using the first generation  
of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome  
based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s)  
under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search  
area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired  
performance of the machine is demonstrated,

wherein the coordinates and/or the size of the search area in the selection space  
are changed in accordance with the score(s) of the adapted chromosome(s).

3 (currently amended): ~~The~~A method ~~according to Claim 1~~for controlling performance of  
a machine controlled by at least one control module having an input-output relationship regulated  
by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control  
parameters by preselecting genes constituting the first generation of chromosomes from a  
selection space used as a gene pool, and activating the machine using the first generation  
of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome  
based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the selection of genes is conducted randomly in the search area.

4 (currently amended): The method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the selection of genes is conducted in the search area based on the coordinates of the genes of the adapted chromosome(s).

5 (currently amended): The method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the central coordinates of the search area of the subsequent generation is set at the coordinates of the genes of the adapted chromosome(s) in the selection space.

6 (currently amended): The method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the central coordinates of the search area of the subsequent generation is set in the selection space at coordinates calculated from weighted averages of the coordinates of the chromosomes of the current generation based on their scores.

7 (currently amended): The method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the size of the search area for a subsequent generation is changed in accordance with the scores of the chromosomes of the current generation.

8 (original): The method according to Claim 7, wherein the size of the search area for a subsequent generation is changed in accordance with the score(s) of the adapted chromosome(s).

9 (original): The method according to Claim 7, wherein the size of the search area for a subsequent generation is changed in accordance with the average score of the respective chromosomes of the current generation.

10 (currently amended): The method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the size of the search area for a subsequent generation is changed in accordance with a distance between the central coordinates of the search area for the current generation and the central coordinates of the search area for the subsequent generation.

11 (currently amended): TheA method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the size of the search area for a subsequent generation is changed in accordance with the central coordinates of the search area of the subsequent generation.

12 (currently amended): TheA method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a

selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space:

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein a group of candidate chromosomes of a subsequent generation is selected based on distances between any candidate chromosomes of the subsequent generation in the selection space.

13 (currently amended): TheA method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein a group of candidate chromosomes of a subsequent generation is selected based on distances between chromosomes generated currently and in the past in the selection space.

14 (currently amended): TheA method according to Claim 12for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the distances are defined using vectors connecting any two coordinates of genes.

15 (original): The method according to Claim 13, wherein the distances are defined using vectors connecting any two coordinates of genes.

16 (currently amended): TheA method according to Claim 1for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the indicative signals are sensory signals, and a user who operates the machine scores the chromosomes based on the sensory signals.

17 (currently amended): TheA method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;

(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area, and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the indicative signals are electronic signals, and a device which receives the signals scores the chromosomes by comparing values of the signals with preselected target values.

18 (currently amended): TheA method according to Claim 1 for controlling performance of a machine controlled by at least one control module having an input-output relationship regulated by control parameters, said method comprising the steps of:

(a) configuring a first generation of chromosomes coding for the control parameters by preselecting genes constituting the first generation of chromosomes from a selection space used as a gene pool, and activating the machine using the first generation of chromosomes, said genes being defined by coordinates in the selection space;

(b) selecting and scoring adapted chromosome(s) by evaluating each chromosome based on signals indicative of performance of the machine;



(c) setting a search area in the selection space in accordance with the score(s) under predetermined rules;

(d) selecting genes for a subsequent generation of chromosomes within the search area. and operating the machine using the subsequent generation of chromosomes; and

(e) repeating steps (b) through (d) while operating the machine until desired performance of the machine is demonstrated,

wherein the machine is a motor.

19 (new): The method according to Claim 16, wherein the machine is a vehicle, and the sensory signals are related to the user's ride comfort.

20 (new): The method according to Claim 19, wherein the machine is an electronic throttle provided in the vehicle, which is controlled by the control module.

21 (new): The method according to Claim 20, wherein the input and output of the control module are accelerator operation amount and electronic throttle valve opening, respectively.

22 (new): The method according to Claim 20, wherein the control parameters include first-order time lag constant (DR) and acceleration compensation factor (AG).

23 (new): The method according to Claim 19, wherein the vehicle is a motorcycle.